



TUBING INSPECTION
PROBE CATALOG - APRIL 2012



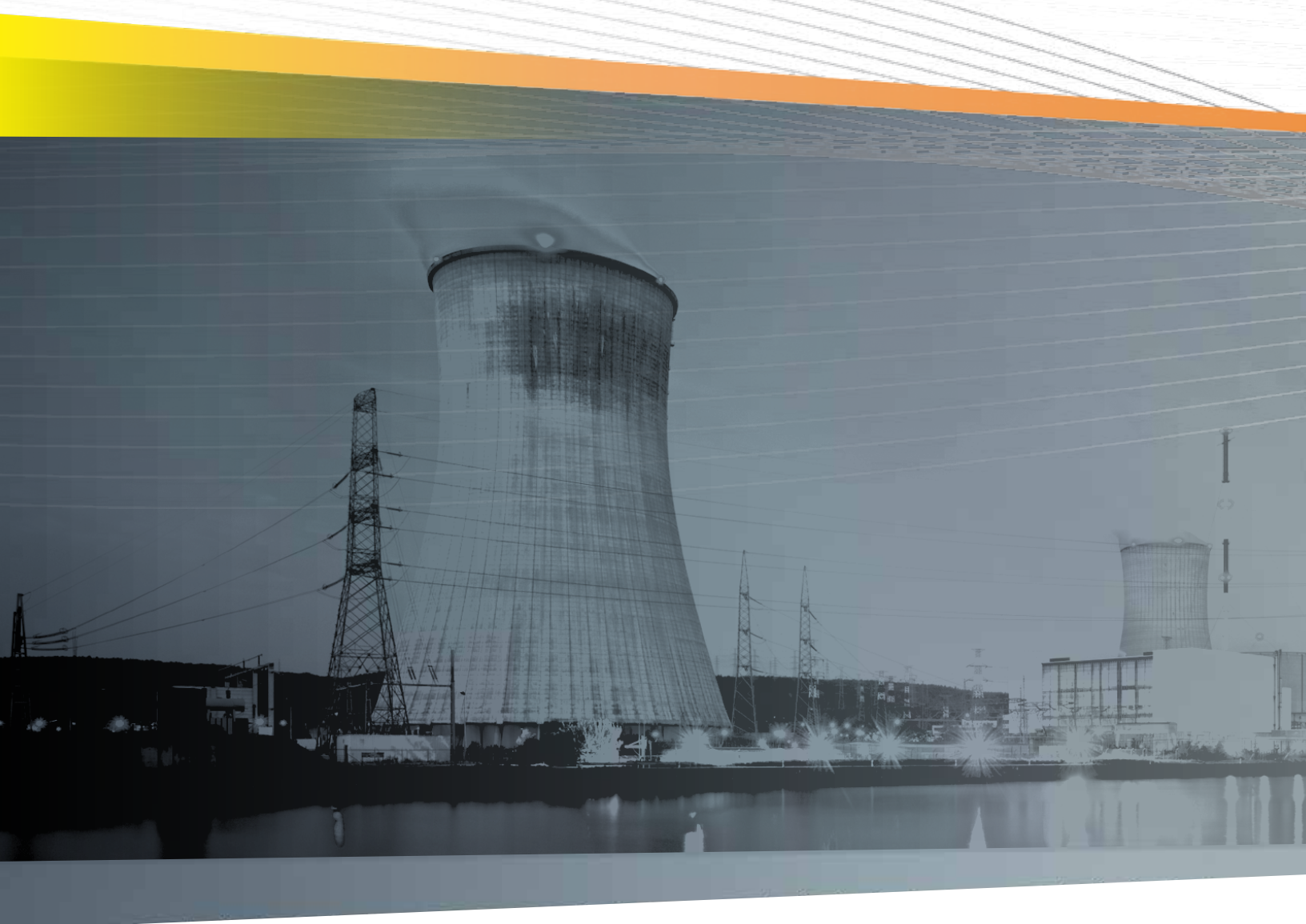
What We Do

Established in Québec City, Canada, since 2009, Eddyfi is the newest and most dynamic company in the field of non-destructive testing (NDT) equipment. It was created following the reorganization of Zetec Canada and today employs experts with backgrounds at Zetec, R/D Tech, and Tecrad.

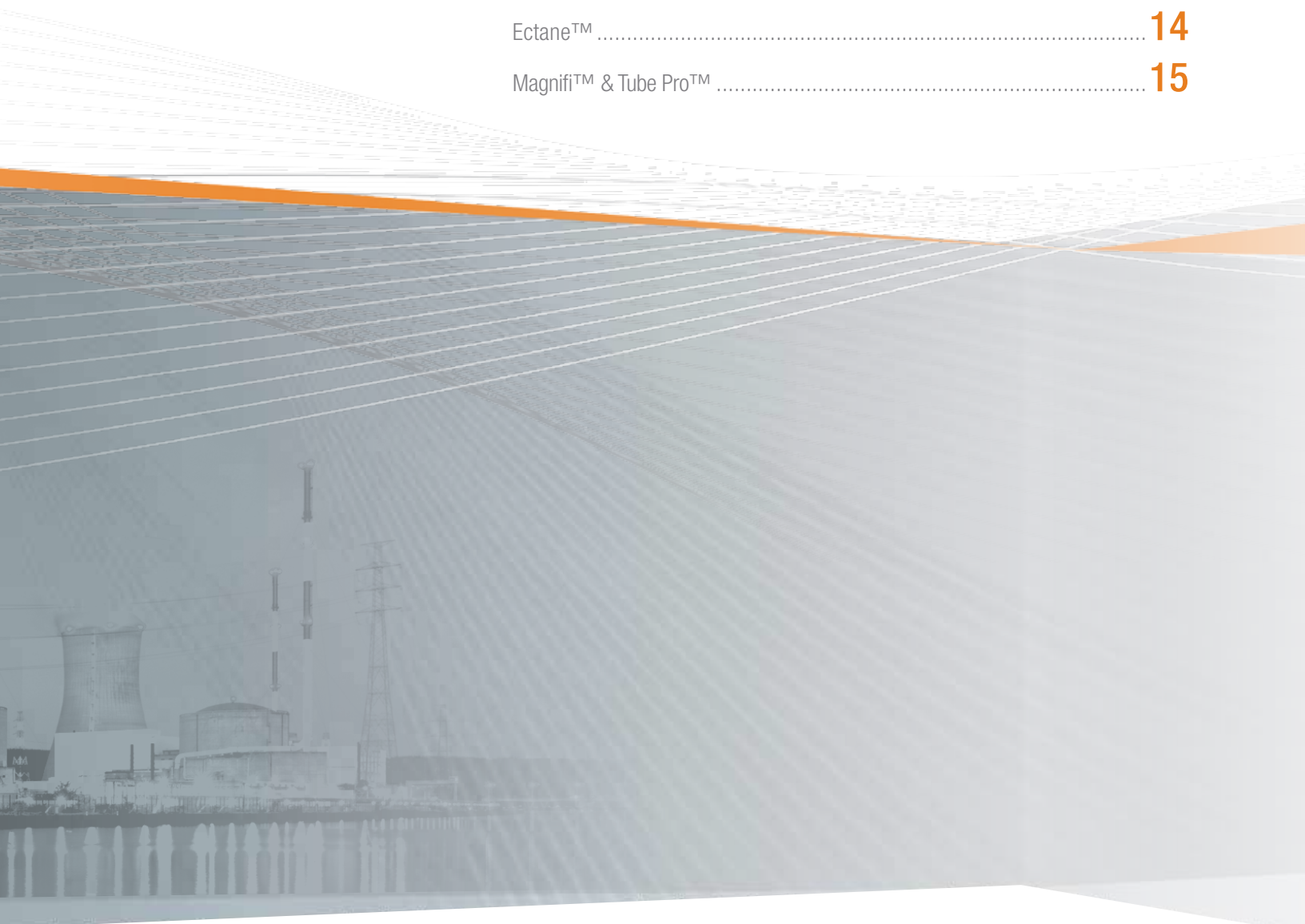
Our eddy current experts develop the industry's best performing and most reliable test instruments, scanners, probes, and acquisition and analysis software. All are designed specifically for critical component inspections requiring permanent data recording and offline analysis.

Eddyfi is a private and independent company. With all our industry expertise and experience, we push forward, fine-tuning the user experience and our customized service to provide our clients with the utmost in high-performance eddy current inspection solutions.

At Eddyfi, performance matters.



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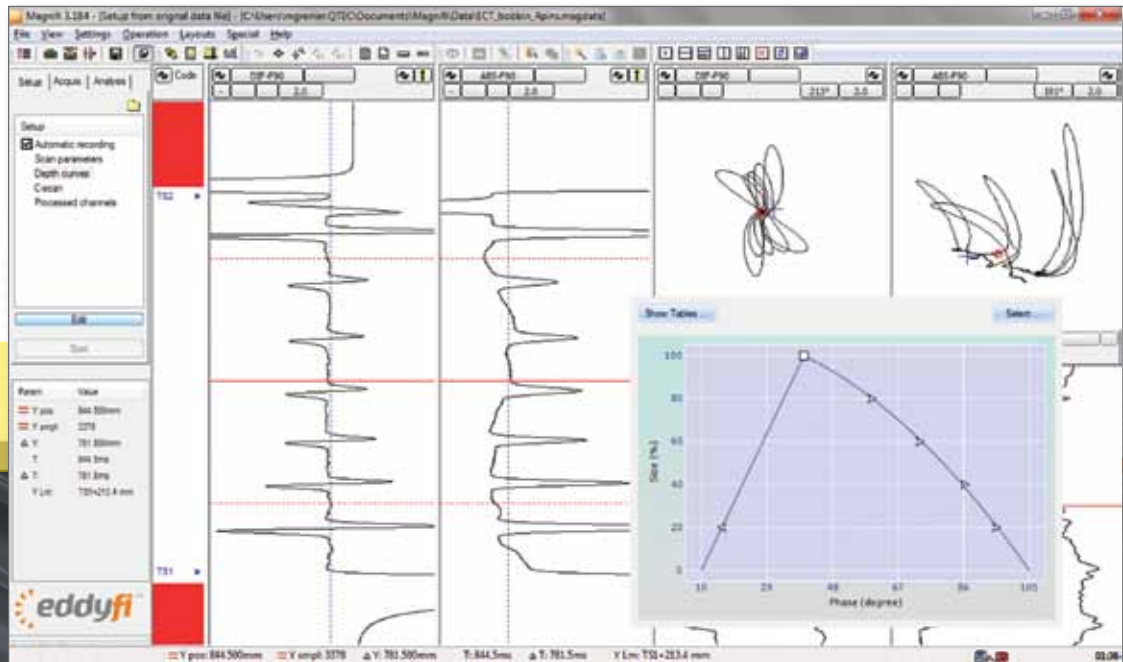


Eddy Current Technology (ECT)

Eddy current is the best method for inspection of non-ferrous tubing. It can detect and size defects affecting tubing such as steam erosion, baffle cuts, pitting, and cracking. Eddy current is especially good for detection of defects under support plates.

In a basic bobbin probe, two coils are excited with an alternating electrical current. The coils produce a magnetic field that induces eddy currents along the circumference of the tube. If a defect disturbs the eddy current flow, the impedance of the coil will change and be measured by the acquisition unit. Using two frequencies, it is possible to eliminate the support plate disturbance and only keep the relevant flaw information. Using three or four frequencies permits defect discrimination against foreign objects (loose bolt), iron or copper deposit.

This inspection technique is suitable for austenitic stainless steel such as SS304/SS316, brass (70/30), Inconel, titanium, copper-finned, and others.





Bobbin Probe – Standard

FEATURES

- Advanced lightweight polymer body
- Wear-resistant guides
- Detachable connectors (optional)
- 4-Pin Amphenol® Connector

GOOD FOR

- Most common defects (corrosion, wear, pitting)
- Non-ferromagnetic materials
- Condensers, heaters, heat exchangers

Eddyfi's standard bobbin probes are made with an advanced lightweight polymer body and stainless steel wear-resistant guides. They are offered with either the standard attached cable, or an optional detachable connector. Instrument-side, the connector is the standard 4-pin Amphenol®. Bobbin probes are offered in diameters ranging from 8,0 mm (0.320 in.) to 25,0 mm (1 in.) in increments of 0,02 mm (0.010 in.). Between 25 mm (1 in.) and 50 mm (2 in.), probes are available in increments of 0,5 mm (0.02 in.). The smallest probe available in a detachable design is 11 mm (0.440 in.).

PRBT-ECT-BBST-wwwXX-Yzz

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SELECTION GUIDE

ECT PROBE DIAMETERS AND FREQUENCIES

Diameters

		TUBE WALL THICKNESS (BWG, MM, IN.)														
BWG		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
mm		3,4	3,05	2,77	2,41	2,11	1,83	1,65	1,47	1,24	1,07	0,89	0,81	0,71	0,65	0,56
in.		0.135	0.120	0.109	0.095	0.083	0.072	0.065	0.058	0.049	0.042	0.035	0.032	0.028	0.022	0.022
TUBE OUTSIDE DIAMETER	12,70 mm (0.500 in.)	-	-	-	-	-	082	086	090	094	098	102	102	104	106	108
	15,87 mm (0.625 in.)	082	090	096	102	108	114	118	122	126	128	132	134	136	136	138
	19,05 mm (0.750 in.)	114	122	126	134	140	144	148	152	156	158	162	164	166	166	168
	22,22 mm (0.875 in.)	144	152	156	164	168	174	178	180	186	188	192	194	196	196	198
	25,40 mm (1.000 in.)	174	182	186	194	198	204	208	210	216	218	222	224	224	226	228
	31,75 mm (1.250 in.)	234	240	246	255	260	265	265	270	275	280	280	285	285	285	285
	38,10 mm (1.500 in.)	295	300	305	310	320	325	325	330	335	335	340	340	345	345	345
	50,80 mm (2.000 in.)	415	420	425	430	435	440	445	450	455	455	460	460	465	465	465

Frequencies

		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
mm		3,4	3,05	2,77	2,41	2,11	1,83	1,65	1,47	1,24	1,07	0,89	0,81	0,71	0,65	0,56
in.		0.135	0.120	0.109	0.095	0.083	0.072	0.065	0.058	0.049	0.042	0.035	0.032	0.028	0.025	0.022
MATERIAL	Aluminum	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
	Aluminum bronze	UF	UF	UF	UF	UF	UF	UF	UF	UF	LF	LF	LF	LF	LF	LF
	Brass (admiralty)	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	LF	LF	LF	LF
	Brass (70/30)	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	LF	LF	LF	LF
	Brass (85/15)	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	LF	LF	LF
	Brass (95/5)	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	LF
	Copper	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF	UF
	Copper-nickel (70/30)	UF	UF	UF	UF	UF	LF	LF	LF	LF	LF	LF	MF	MF	MF	MF
	Copper-nickel (90/10)	UF	UF	UF	UF	UF	UF	UF	UF	LF	LF	LF	LF	LF	LF	MF
	Copper-nickel	UF	UF	UF	UF	UF	UF	UF	UF	UF	LF	LF	LF	LF	LF	LF
	Inconel 600	UF	LF	LF	LF	LF	LF	LF	LF	MF	MF	HF	HF	HF	HF	HF
	Monel	UF	UF	UF	UF	LF	LF	LF	LF	LF	LF	MF	MF	MF	MF	HF
	Stainless steel 304/316	UF	UF	LF	LF	LF	LF	LF	LF	LF	MF	MF	MF	HF	HF	HF
	Titanium	UF	UF	UF	UF	LF	LF	LF	LF	LF	LF	MF	MF	MF	MF	HF
	Zirconium	UF	UF	UF	UF	UF	LF	LF	LF	LF	LF	MF	MF	MF	MF	HF

CODE	FREQUENCY IN KHZ		
	Min.	Max.	Central
UF	1	10	5
LF	10	100	50
MF	50	500	250
HF	100	1000	500



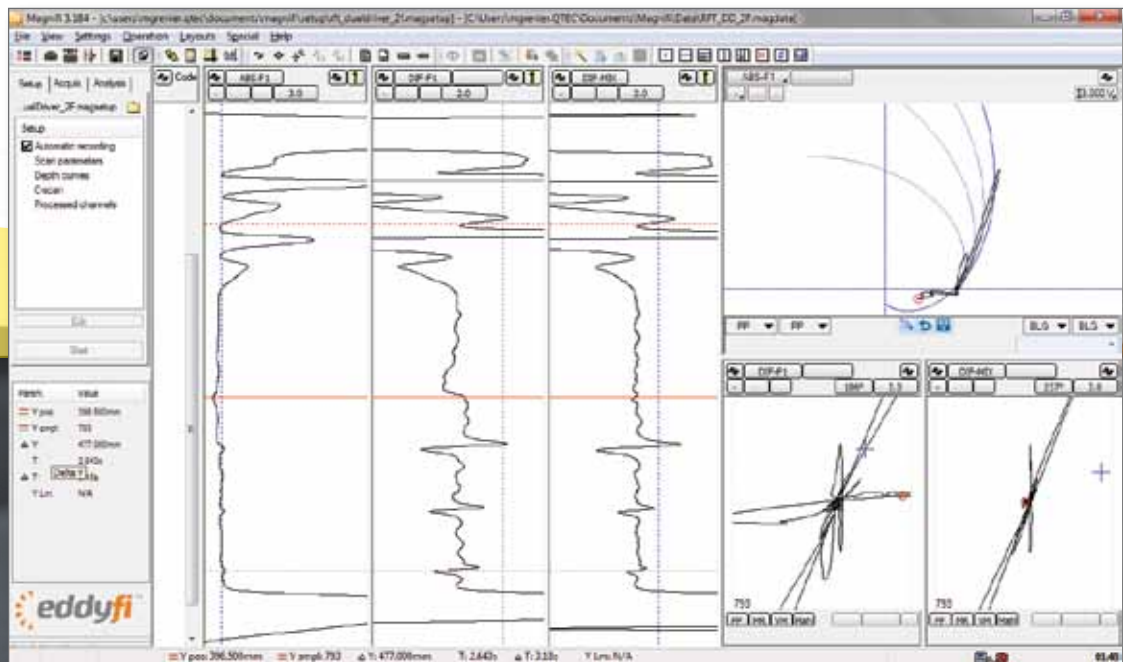
Remote Field Technology (RFT)

Remote Field Testing is the best method for inspection of ferrous tubing. RFT has an equal sensitivity to ID and OD indications and can detect and size defects affecting tubing such as steam erosion, baffle cuts, and pitting. Several probe designs are available for wall loss measurement, pit sizing, and flaw detection hidden by a support plate.

RFT is a through-transmission technique where the receiver coil senses the flux lines that cross tube walls twice. Detector coils are separated from the exciter coil by a distance equivalent to 2 to 3 times the tube outside diameter. Remote Field Testing is suitable for carbon steel such as SA-179, SA-214, boiler tubes, ferritic stainless steel (SS439), nickel, and other ferromagnetic materials.

A special graphical representation of the RFT technique, called voltage plane, can be used for accurate and reliable analysis of absolute signals. In voltage planes, defects can be easily sized for depth and volume. Furthermore, voltage planes allow for discrimination against permeability variations.

Eddyfi's software, Magnifi™, offers best-in-class voltage plane implementation. It allows extrapolation of long and taper defects, easily stores and retrieves nominal tube signal, and simultaneously compensates for material variations for absolute and differential signals.





Single Driver Probe – Standard

FEATURES

- Optimized for absolute signal analysis
- Reduced friction noise
- Detachable connector (optional)
- 19-Pin Amphenol® Connector

GOOD FOR

- Most common defects (corrosion, erosion, wear, pitting)
- Defects located at tubesheet
- Ferromagnetic materials
- Heat exchangers, feedwater heaters

Eddyfi's standard single driver probes are optimized for absolute signal analysis and reduced friction noise. They are offered with either the standard attached cable, or an optional detachable connector. Instrument-side, the connector is the 19-pin Amphenol®. Eddyfi's standard single driver probes are offered in diameters ranging from 9,0 mm (0.354 in.) to 24,0 mm (0.945 in.), in 1,0 mm (0.039 in.) increments and from 24,0 mm (0.945 in.) to 40,0 mm (1.575 in.) in increments of 2,0 mm (0.079 in.). Probe bodies are made of advanced lightweight polymer at diameters of 20,0 mm (0.787 in.) and upward. Below these diameters, probe bodies are offered with a stainless steel sleeves.

PRBT-RFT-SDST-wwwXX-Yzz

CODE	DIAMETER
090	9.0 mm
100	10.0 mm
...	
200	20.0 mm
220	22.0 mm
...	
400	40.0 mm

CODE	FREQUENCY IN HZ		
	Min.	Max.	Central
LF	10	400	50
MF*	50	2000	300
HF	500	20000	2500

* Typical frequency range

POLY	
CODE	MATERIAL
N	Nylon

POLY	
CODE	LENGTH
20	20 m (65 ft)
30	30 m (98 ft)



Single Driver Probe – Boiler

FEATURES

- Spring-loaded centering device
- Highly flexible design
- Waterproof
- 19-Pin Amphenol® Connector

GOOD FOR

- Most common defects (corrosion, erosion, wear, pitting)
- Ferromagnetic materials
- Boilers

Eddyfi's single driver boiler probes come with a modernized spring-loaded centering device. Their design is waterproof and extremely flexible, to allow for easy travel along tight bends. Instrument-side, the connector is the 19-pin Amphenol®. Eddyfi's single driver boiler probes are offered in diameters corresponding to the most common boiler tubes found on the market. Custom probe diameters can also be provided to suit specific needs.

PRBT-RFT-SDBL-wwwXX-Yzz

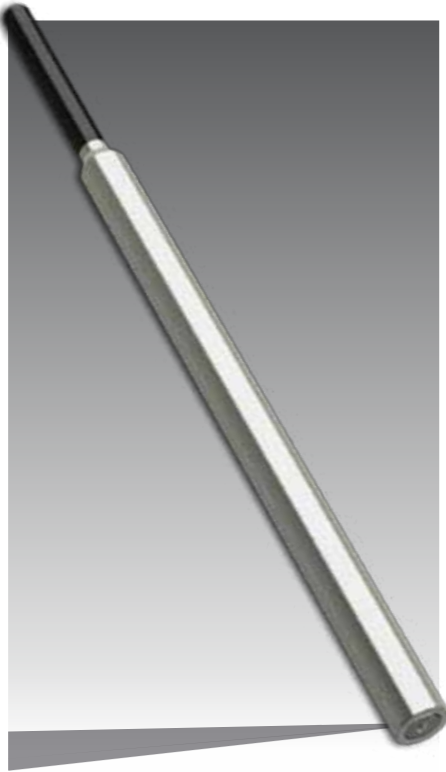
CODE	DIAMETER
260	26.0 mm
320	32.0 mm
360	36.0 mm
400	40.0 mm
450	45.0 mm
500	50.0 mm
...	
700	70.0 mm

CODE	FREQUENCY IN HZ		
	Min.	Max.	Central
LF*	10	400	50
MF	50	2000	300
HF	500	20000	2500

* Typical frequency range

POLY	
CODE	MATERIAL
N	Nylon

POLY	
CODE	LENGTH
20	20 m (65 ft)
30	30 m (98 ft)



Dual Driver Probe – Standard

FEATURES

- Optimized for differential signal analysis
- Reduced friction noise
- Detachable connector (optional)
- 19-Pin Amphenol® Connector

GOOD FOR

- Most common defects (corrosion, erosion, wear, pitting)
- Defects located at tube support plate
- Ferromagnetic materials
- Heat exchangers, feedwater heaters

Eddyfi's standard dual driver probes are optimized for differential signal analysis and detection of defects close to tube support plate. They are offered with either the standard attached cable, or an optional detachable connector. Instrument-side, the connector is the 19-pin Amphenol®. Eddyfi's standard dual driver probes are offered in diameters ranging from 10,0 mm (0.394 in.) to 20,0 mm (0.787 in.), in 1,0 mm (0.039 in.) increments and from 20,0 mm (0.787 in.) to 40,0 mm (1.575 in.) in 2,0 mm (0.079 in.) increments. Probe bodies are made of advanced lightweight polymer at diameters of 20,0 mm (0.787 in.) and upward.

PRBT-RFT-DDST-wwwXX-Yzz

CODE	DIAMETER
100	10.0 mm
110	11.0 mm
...	
200	20.0 mm
220	22.0 mm
...	
400	40.0 mm

CODE	FREQUENCY IN HZ		
	Min.	Max.	Central
LF	10	400	50
MF*	50	2000	300
HF	500	20000	2500

* Standard frequency range

POLY	
CODE	MATERIAL
N	Nylon

POLY	
CODE	LENGTH
20	20 m (65 ft)
30	30 m (98 ft)

SELECTION GUIDE

RFT PROBE DIAMETERS AND FREQUENCIES

Diameters

		TUBE WALL THICKNESS (BWG, MM, IN.)											
BWG		4	6	8	10	11	12	13	14	15	16	17	18
mm		6,05	5,16	4,19	3,4	3,05	2,77	2,41	2,11	1,83	1,65	1,47	1,24
in.		0.238	0.206	0.165	0.135	0.120	0.109	0.095	0.083	0.072	0.065	0.058	0.049
TUBE OUTSIDE DIAMETER	12,70 mm (0.500 in.)	-	-	-	-	-	-	-	-	-	-	-	090
	15,87 mm (0.625 in.)	-	-	-	-	-	090	100	100	110	110	110	120
	19,05 mm (0.750 in.)	-	-	090	110	110	120	120	130	130	140	140	140
	22,22 mm (0.875 in.)	-	100	120	130	140	140	150	160	160	160	170	170
	25,40 mm (1.000 in.)	-	130	150	160	170	170	180	180	190	190	190	200
	31,75 mm (1.250 in.)	180	180	200	220	220	220	240	240	240	240	240	260
	38,10 mm (1.500 in.)	220	240	260	280	280	280	280	300	300	300	300	300
	50,80 mm (2.000 in.)	320	320	360	360	360	360	400	400	400	400	400	400
	63,50 mm (2.500 in.)	450	450	450	450	500	500	500	500	500	500	500	500
	76,20 mm (3.000 in.)	550	550	550	600	600	600	600	600	600	600	600	600
	88,90 mm (3.500 in.)	650	650	650	700	700	700	700	700	700	700	700	700

Frequencies

		TUBE WALL THICKNESS (BWG, MM, IN.)											
BWG		4	6	8	10	11	12	13	14	15	16	17	18
mm		6,05	5,16	4,19	3,4	3,05	2,77	2,41	2,11	1,83	1,65	1,47	1,24
in.		0.238	0.206	0.165	0.135	0.120	0.109	0.095	0.083	0.072	0.065	0.058	0.049
MATERIAL	Carbon steel - A178, A179, A192, A214	LF	LF	LF	LF	MF	MF	MF	MF	MF	MF	MF	MF
	Cast iron (gray)	LF	MF	MF	MF	MF	MF	MF	MF	HF	HF	HF	HF
	Ductile iron	LF	LF	LF	MF	MF	MF	MF	MF	MF	MF	MF	HF
	Nickel 200	LF	LF	LF	LF	MF	MF	MF	MF	MF	MF	MF	MF
	Stainless Steel 439 - A268 TP439	MF	MF	HF	HF	HF	HF	HF	HF	HF	HF	HF	HF
	Stainless Steel Duplex (2205), 3RE60 - A789	MF	HF	HF	HF	HF	HF	HF	HF	HF	HF	HF	HF

CODE	FREQUENCY IN KHZ		
	Min.	Max.	Central
LF	10	400	50
MF	50	2000	300
HF	500	20000	2500

CABLES & ADAPTERS

Cables for Detachable Probes



FEATURES

- User friendly secure connection
- Highly kink resistant
- Good rigidity

GOOD FOR

- Reducing shipping cost
- Reducing inventory
- Gear volume/weight

PART NUMBER	DESCRIPTION
PRBT-ECT-CBL-D095-N15	Detachable probe poly for eddy current bobbin probes, 9.5 mm diameter, Nylon material, 15 m long.
PRBT-ECT-CBL-D095-N20	Detachable probe poly for eddy current bobbin probe, 9.5 mm diameter, Nylon material, 20 m long.

Adapters

PART NUMBER	DESCRIPTION
PRBT-ADAPT-41-4	ECT bobbin probe adaptor from ECTANE™ 41-pin connector to 4-pin Amphenol® probe connector.
PRBT-ADAPT-41-6	ECT bobbin probe adaptor from ECTANE™ 41-pin connector to 6-pin Jeager™ probe connector.
PRBT-ADAPT-19-8	MFL probe adaptor from ECTANE™ 19-pin connector to 8-pin Amphenol® probe connector.

Ectane™

SURFACE ARRAY AND TUBE INSPECTION SYSTEM

Eddyfi brings to the field a combination of power and functionality that has never been available before in such a small and light remote data acquisition unit. The Ectane™ is a new kind of no-compromise, high-performance inspection instrument with a strong bent on usability. Ectane is a field-ready multi-technology surface and tube inspection instrument. In many ways, we believe that the Ectane redefines the potential of electromagnetic technologies for tube NDT inspections.

Small and Light

Key to the Ectane™ is the form factor and packaging. The instrument is compact, at roughly 610 in³ (10 liters). Its 100% magnesium alloy casing comes in at less than 15 lb. (5.9 kg). with batteries and multiplexer. Such a light instrument does not need to be carried in a backpack or some kind of trolley; you can simply carry it in your hand.

Sealed Enclosure

With its rugged and completely sealed enclosure, you can use the Ectane in the world's most inhospitable inspection environments, be it a nuclear contaminated area or a highly dusty environment.

Inspection Flexibility

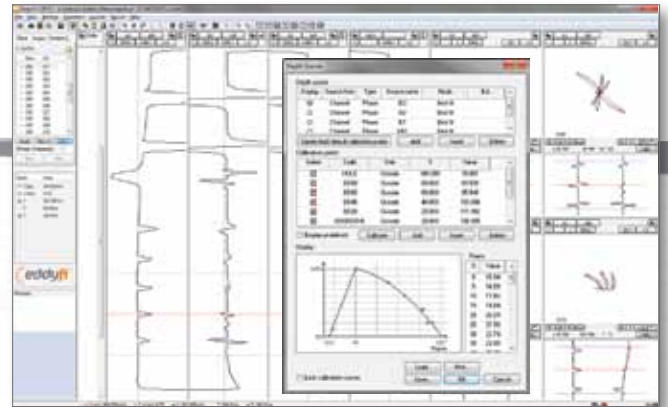
The Ectane provides new features that will add flexibility to your inspection programs. The plug-and-play connectivity of the instrument and the self-calibration tool can all help increase the productivity and general efficiency of your team. The instrument's two batteries can be used as your main power source, or as backup, should power from the outlet be interrupted during the acquisition.



Magnifi™

ADVANCED EDDY CURRENT DATA ACQUISITION AND ANALYSIS SOFTWARE

Eddyfi™ presents Magnifi™, the most comprehensive, and reliable acquisition and analysis software for multi-technology surface and tube inspections. Magnifi is considered the preferred solution for mission-critical inspections that demand data storage and advanced analysis.



Compatibility Legacy

Magnifi™ can drive the Ectane™ as well as TC7700™ and MS5800™ instruments. Magnifi™ reads back most data files acquired by MS5800™ and TC7700™ product line instruments and setup files created with ECVision® and EddyView™ software. Magnifi™ is also compatible for dual use and mixed-technology inspections with Zetec's UltraVision®. It even exports tube data in tubesheet mapping software such as TubePro™, CARTO™, or TSD™-compatible formats.

Forward-thinking

Magnifi™ is Windows® XP-/Windows® 7-compatible and offers three independent but perfectly integrated operating modes: setup, acquisition, and analysis. The program provides the detailed features and specific tools required for advanced array technology, RFT, and IRIS. It also provides detailed and customizable reporting features that can be matched to a variety of inspection needs and environments. Finally, Magnifi™ is fully supported, with a SDK program, a full-fledged customization program, technical support, user documentation, and training.

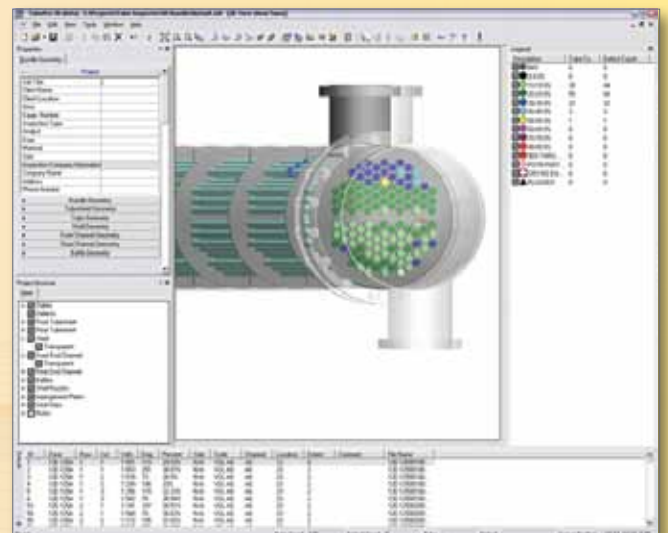
So long BootP!

An innovation of particular interest is Magnifi™'s plug-and-play connectivity with Ectane™. The days of BootP voodoo sessions are gone. Magnifi™ also provides options for hardware keys and PC-dedicated software keys.

Tube Pro™

This is the latest generation of 2D and 3D heat exchanger tube mapping software program. It is designed for inspection, testing, data management, tracking and reporting for the NDE/NDT industry. Eddyfi has partnered with ISS because we share a philosophy of "easy to learn and simple to use".

Despite its apparent simplicity, TubePro allows for advanced reporting, automated 3D visualization and rapid tube map creation. The use of fully customizable drawing and report templates along with automated 2D and 3D defect data import ensures fast, accurate and consistent reporting throughout any organization. TubePro's user interface and reports can easily be translated into any language. Version 4 also supports multiple drawings, corrosion projections, multiple inspection reports, boiler drawings, 3D hairpin and multiple connected U-Tube section and more.





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